DOCUMENT RESUME

ED 171 056 EC 115 265

AUTHOR Hasenstab, M. Suzanne; And Others
TITLE Comprehensive Services for Hearing Impaired and Language Delayed Infants and Preschool Children.
PUB DATE Apr 79
NOTE 21p.; Paper presented at the Annual International Convention, The Council for Exceptional Children (57th, Dallas, Texas, April 22-27, 1979, Session F-19)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Auditory Evaluation; *Aurally Handicapped; *Delivery Systems; Educational Diagnosis; *Exceptional Child Services; Infancy; *Interdisciplinary Approach; Intervention; *Language Handicapped; Parent Participation; Preschool Education; *Student Evaluation

ABSTRACT

The paper addresses the Comprehensive Services Program which takes an interdisciplinary approach to meeting the needs of preschool hearing impaired and language delayed children. The program is reported to be comprised of two major areas--assessment of the child's development and functioning level and educational intervention. Assessment is explained to focus on three major concerns: audiological evaluation, language and speech analysis, and psychoeducational or developmental evaluation. Educational intervention is noted to be facilitated through four basic alternatives: the parent-infant program, for children under 24 months developmentally; the nursery school, which services children functioning at a 2-3 year level; the pre-kindergarten, in which 4-and 5-year-olds are enrolled; and cooperative services with other agencies, which involve multihandicapped children the program is not equipped to handle. (SBH)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED171056

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION
THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

Comprehensive Services

for

Hearing Impaired & Language Delayed

Infants and Preschool Children

M. Suzanne Hasenstab, Ph.D.
Director - Hearing Impairment
University of Virginia
Department of Speech Pathology
and Audiology
109 New Cabell Hall
Charlottesville, Virginia 22903

John S. Horner, Ph.D.
Director - Audiology
University of Virginia
Department of Speech Pathology
and Audiology
109 New Cabell Hall
Charlottesville, Virginia 22903

Beverly R. Dicoskey, M.Ed.
Clinical Supervisor
Hearing Impairment

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

CEC

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

EC 115265

Introduction*

The University of Virginia, Department of Speech Pathology and Audiology, has had as a primary goal for the past three years, the provision of comprehensive services for hearing impaired and language delayed infants and preschoolers. The philosophy upon which the Comprehensive Services Program is based is that the needs of preschool hearing impaired and language delayed children can best be met through an interdisciplinary approach of the involved professions. These professions include medicine, audiology, psychology and education. In this particular comprehensive services program all major members of the inter-disciplinary team are with the University of Virginia Hospital or the Department of Speech Pathology and Audiology.

The realization of this goal has come about primarily through the research and dedication of the areas of Audiology, under the direction of Dr. John S. Horner, and Education of the Hearing Impaired, directed by Dr. Suzanne Hasenstab.

Program Components

The Comprehensive Services Program is comprised of two major areas. The first is Assessment. Our goal in assessment is to learn as much as we possibly can about all areas of the child's development and functioning level. In this area there are three major concerns: the first is audiological evaluation. We must know if a hearing loss is actually present, and if so, the degree of that loss and the extent of the child's auditory functioning. In the second concern - language and speech analysis, we are interested regarding the language function-

* Please note - this presentation was made in conjunction with slides to clarify and illustrate various pertinent points especially regarding instruments and materials.

ing level of the child when he enters the program, and then to provide a continuous monitoring process as he progresses. The third concern - psychoeducational or developmental evaluation, is a necessary and integral part of the assessment area as we are concerned with the overall development of the child within a preschool setting.

The other major area is Educational Intervention. Our goal is to facilitate the development of language and/or listening skills within the child's functioning environment. In this area exists four basic alternatives: first, The Parent-Infant Program , for children under twenty-four months developmentally; second, The Nursery School, which services children functioning at a two to three year old level; third, The Pre-Kindergarten , in which four and five year olds are enrolled, and fourth, Cooperative Services with other agencies, which will be discussed later.

Referrals

The initial step in the Comprehensive Services Program is referral. Children come to us either with a diagnosed or suspect hearing loss or language delay. Parents often make their own referrals directly to the Center. We also receive requests to service children from physicians, primarily pediatricians, throughout the Central Virginia Area. Other medical referrals come via the University of Virginia Hospital, Family and health service agencies located both within the immediate Charlottesville area and in other areas throughout the state, and even into West Virginia are also a frequent source of referrals. In addition, the new awareness of young handicapped children that has come about through Child Find efforts has spawned many

referrals from public school divisions.

After a referral has been made the child is scheduled for an audiological evaluation. If there is a suspected hearing loss, the reason is obvious. In the case of a language delay we must first rule out hearing impairment as a cause for the delay in language and speech development. Indeed several children originally referred as language delay were found to have a mild to moderate hearing loss.

Assessment

Audiological Evaluation

The lack of hearing sensitivity and its accompanying difficulties in learning are sufficiently overwhelming unto themselves. We are becoming increasingly aware of the irreversible anatomical and physiologic damage which can develop from sensory deprivation. Research in visual deprivation with animals and people has shown that lack of stimulation to the causes, cell atrophy, bio-chemical changes, electrophysiologic abnormalities, retardation in learning to utilize the sensory system. Recently at the University of Virginia and the Kresge Institute in New Orleans, it has been confirmed that these problems also apply to the auditory modality. Sensory stimulation must begin in infancy or at the time of the onset of hearing loss, as in cases such as hearing impairment resulting from spinal meningitis. It is necessary to not only to facilitate learning but also to maintain the maturation and function of the sensory system.

At the University of Virginia we are actively seeking to develop techniques that will permit early identification and measurement of hearing loss in infancy.

These techniques include such familiar approaches as the Crib-O-Gram, Brain-Stem Audiometry and traditional Behavioral Observation Audiometry. We have begun a high risk register as well.

We are particularly interested in gaining pure tone thresholds as well as identifying the various talents of the auditory system at supra threshold levels. We have been working on techniques to lower the age level at which we can actually measure a child's hearing. Through conditional behavior audiometry, such as Visual Reinforcement Audiometry or Visual Reinforcement Operant Conditioning Audiometry, we can test the thresholds of infants as young as four and a half(4-1/2) months. Our initial research successfully tested hearing in 31 normal children down to this age level with excellent results.

This type of evaluation is different from traditional Behavioral Observation Audiometry, which involves use of whistles, bells and so on, to evoke a response from a child. It assesses the child's activity level before and after stimulation via sound. Many responses are acceptable. In conditioned behavior audiometry we control the level of activity of the child. He/she is kept partially bored, then a particular stimulus is produced and a particular response is sought, a conditioned behavior in the form of a head turn toward a specific source, the visual reinforcement box.

The visual reinforcement box was originally designed in Seattle. Based on this idea we have developed our own with several new adaptations to it. An animated animal is enclosed in a wood and tinted plexiglass box. In the proper lighting the animal is not visible to the child. When the signal to the child is given a

light within the box illuminates the animal and also animates it so that the child sees a lighted furry dog beating on a drum, or a monkey banging cymbals. Then the light goes off and the animals disappears. We use several different reward animals during the course of an evaluation session in order to maintain the child's interest. This is especially necessary with "older" babies around 9 to 12 months of age.

We begin the procedure by placing the bone vibrator on the child. We have found that in order to condition the child to an activity such as this, there must be a definite link between the conditioning stimulus and the reward. The child must realize that connection between reward and what he hears or feels. Therefore we use bone conduction; if you turn it loud enough or strong enough, even if the child is profoundly hearing impaired, he will feel it tactilly, so there will be a linking of the stimulus to the reward. After conditioning is complete the session continues. A sound stimulus is presented, if the child is aware of it, he will turn toward the visual reinforcement box and the animal will become visible.

These are some sample audiograms (on slides) with thresholds by pure tones at 250, 1000, and 4000 Hz in each ear under earphones. This provides a good foundation to estimate the entire audiogram. There is enough information contained in these three frequencies. The reason this is done is because you are never really sure how entirely cooperative an infant will remain. We try to gain the maximum amount of information in a short time period. We also do bilateral bone conduction to give use more information.

As children become slightly older, (near age 2) they may become bored with turning toward an animated animal. We therefore use another technique which involves the child in a manipulation activity. This allows us to present the signal and to train the child to respond by pressing this large white button when she/he hears the sound. The button sets the animal in motion. This is called VROCA or Visual Reinforcement Operant Conditioning Audiometry. During training a light in the button accompanies the sound signal. This cue is faded out once conditioning is accomplished. This technique is also used at the University of Washington.

An important component of the audiological evaluation is Impedance Audiometry. This is an objective measurement of functioning in the middle ear system and in the nervous system. A small probe (or tube) is sealed in the auditory canal after the canal and tympanic membrane have been examined for any difficulty. The impedance audiometer presents a readout called a tympanogram depicting the ease of energy transfer in the middle ear. Air pressure is changed within the ear. There is no response required from the child. Impedance audiometry is helped in identifying middle ear disorders.

There are three tubes leading into the probe; the first allows air to move in and out of the canal; the second tube allows a tone to travel down the canal (we observe whether it passes through the tympanic membrane or bounces back); the third has a small microphone which measures the reflected sound. If you know how much sound you introduce, then measure that which is bounced back, you can determine how much sound was able to pass through the tympanic membrane. An ear with

mechanical pathology will bounce the sound back.

Impedance audiometry also permits a bilateral reflex which can be elicited by the earphone on the opposite ear. We can determine if the ear drum moves due to a contraction of the middle ear muscles. A tone can also be sent down the probe tube. This response is called acoustic reflex. Impedance audiometry is very important for hearing impaired children. They simply do not need the added reduction in hearing caused by an additional middle ear problem, due to fluid for example. We carry out impedance procedures routinely every 90 days and more frequently if children are suffering from a cold or other such illness.

After the audiological evaluation is complete if a child demonstrates hearing impairement, she/he is fitted with a hearing aid appropriate to his/her needs. Hearing and hearing aid evaluations are, again routinely carried out, every 90 days.

Language and Speech Analysis and Psychoeducational Evaluation

The second and third component of assessment are language and speech analysis and psycho-educational or developmental evaluation. Hearing impaired children in general have been described as difficult to test and when you are attempting to evaluate preschoolers and infants the problem truly compounds itself.

These are the main instruments we use in this aspect of assessment. We do not exclude others but these are our basic test instruments. With our babies, under age 2-1/2 years, we use the Bayley Scales of Infant Development (19). The Bayley scales children from birth to 30 months. As you can see (from the slide)

the test kit contains a variety of materials. You can stimulate a pleasurable play environment in which to test the child. The Bayley involves some study and experience before you use it well. It can provide a great deal of information if it is used correctly. We usually team up when we administer the Bayley. One person will interact with the child and the other will score and record observations. This allows the examiner with the child to interact more completely without taking time away to score items.

The Bayley has three scales and corresponding score/summary forms. There is a Mental Scale, a Motor Scale, and a Behavior Observation Scale. The Mental Scale, or Index as it is called, is comprised of cognitive and language tasks and behaviors. The language items involve both receptive and expressive language. The Motor Index measures fine and gross motor abilities. Social and emotional behaviors are recorded on the third form.

We have often used the Bayley in the infant's home and enjoyed the assistance of the parents. It's very important when testing babies that they feel secure in the environment or they will simply not perform. Also much valuable information can be gained observing the child within his home situation.

The Curriculum Guide for Hearing Impaired by Winnifred Northcott is used as an ongoing evaluation summary with our babies. New developments are noted and dated in the develop areas and the summary sheets remain in the child's folder. That allows me and the supervisor as well as new clinicians to keep careful account of each baby's progress. The checklists are made up of developmental levels in receptive language, expressive language, auditory awareness,

social, emotional, fine motor, gross motor development and self help skills.

With children older than 2-1/2 we use the McCarthy Scales of Children's Abilities. The McCarthy, a manipulative test, provides a summary profile in five major areas and a composite General Cognitive Scale. The areas assessed are Verbal, Perceptual, Quantitative (which combine to yield the General Cognitive Scale) Memory and Motor. The verbal tasks are both receptive and expressive. Verbal abilities will also affect some of the other scales, especially memory and the examiner must be aware of these items. The Perceptual Index is primarily visual perception ability. Logical problem solving, numbers, and math concepts make up the Quantitative section. Memory is both visual and auditory. The Motor Scale examines large and fine motor abilities. The McCarthy is well planned and alternates activity items with quieter ones. Very few children become bored during testing.

We've made an interesting adaptation in testing procedure with the McCarthy that keeps the children really alert and involved. We arrange our nursery school and adjoining therapy rooms into learning center type stations where one examiner is responsible for two or three items. The children move about from one station to the next. We can test all of the children in a relatively short time period. These sessions are followed by a staff discussion and each child is discussed. It really works well and a great amount of information is gained. All of the examiners must be very familiar with the test however.

The McCarthy is helpful for us with hearing impaired and language delayed children because of the profile scoring. We can note various areas of development and

determine probable retardation or perceptual immaturity for example. An item analysis also helps with follow-up programming recommendations. (This is done with the Bayley as well).

The Vocabulary Comprehension Scale was developed by Tina Bangs to measure conceptsthat children understand. The theory is good but I found several problems using it. Some of our children could not identify with the materials, for example, a garage, and the extraneous vocabulary was unfamiliar to them. Therefore you couldn't be certain whether the child erred on the understanding of next to, or the words ladder or garage in the statement "Put the ladder next to the garage." The summary sheet is excellent. The concepts are divided into catagories and she includes the age at which 80% of the population master understanding of a particular concept. It's very good for normal children but our children have a noted language problem so we don't need to confuse them more.

We are currently developing our own language assessment package. The components are in various stages of completion at present. The section that is finished is similar to the Vocabulary Comprehension Scale in that it is geared to evaluate the concepts a child understands. But we have controlled the (vocabulary and syntax) to a greater degree. We have added several additional concepts to the list as well. All of these materials were made by hand or secured in various places by our second year graduate students. We made about ten of these kits last year and they have worked very well.

In addition to the concept analysis section, we are working on (and using) a language sample analysis approach based on Elaine Hannah's model, to evaluate child language. The sample is elicited in a play situation or some other comfortable environment for the child. The real test of communication is communicative. So it is that spontaneous use of language, whether at a babbling stage or at a stage of sophisticated sentence production. In addition to a syntactic analysis we evaluate what the child is doing semantically (Brown, Mume) and phonologically (Ling).

A language sample is done with all children, even infants, to determine at what stage of linguistic development the child's functioning. It is most important in order to make program recommendations. For example, a 9 month old who is only uttering vowels is delayed in his speech growth. He should be well into babbling. So the evaluation, the language sample, allows us to determine a starting point.

Parental Involvement in Assessment

Parents are an integral part of the entire assessment procedure. With regard to the audiological evaluation one or both parents assist by providing information, holding the child, and amusing the child when necessary. It is of utmost importance that parents understand the explanation of the basics of the testing, (the reason and the results) and the implication of hearing loss for their particular child and include the entire family.

This is also true during a language or psychoeducational evaluation. Parents are asked to observe and/or participate. Each test is explained and results are carefully reviewed. We also make certain parents are receiving consistent and accurate information regarding their child. Therefore, Margaret will observe my testing sessions and I will observe in the audiological evaluation.

We interact with a wide range of educational and economic levels of families in the Central Virginia area. We have found that honesty, clarity, patience and understanding and what is needed to assist parents in helping their children. If additional services are needed, for example, medical problems may be evident, it is discussed with the parents. We will make appointments and even accompany a child and his parents if necessary for extra services to be carried out. Support is extremely important.

Educational Intervention
Parent Infant Program

Assignments to any phase of the Preschool Programs are based on the results of assessment, the child's chronological age or if more applicable, his developmental age, and the geographical location of the family in regard to the center.

The Parent-Infant Program is for children under age 2 or children whose developmental level is under 24 months. This is an in-home program, staffed by our second year associate teachers specializing in infant and pre-school education for the hearing impaired, directly under my supervision. Home visits are made 2 to 3 times weekly. Time periods are flexible but never less than one hour.

During the home sessions, the associate teachers work directly with the child but also provide materials, information and demonstrations to parents so that they may also work with their child. An IEP is made for each baby and is carefully explained to the parent(s) along with suggestions for securing the stated objectives. We have a small toy library for parents. Many families are quite poor so this really helps.

Goals for the children concern the developmental areas of audition, receptive language, cognition, pre-speech and speech, large and fine motor, and self-help skills. Goals for parent(s) are related to acceptance of the handicap relating and interacting with the child, behavior control, hearing aid maintenance and use of materials and activities to stimulate progress in their child's development.

Parent counseling is also part of the Parent-Infant Program. Many times other agencies assist in this area because problems are not limited to the child with a hearing loss. We have come in contact with everything from bed bugs to child abuse. If there is a social agency involved with the family we maintain a close cooperative effort in trying to provide the most advantageous environment that is possible in a given situation. We tried group meetings for parent(s), mostly mothers, on a biweekly basis and discussed topics they felt needed airing, showed films and shared ideas and problems. This worked well in providing mothers with insight into hearing impairment in general and their own situation in particular.

Nursing and PreKindergarten Levels

In the nursery and prekindergarten the primary thrust is the development of listening skills via amplification of the child's residual hearing, and development of language and speech proficiency. These are on-campus programs located next to the Speech and Hearing Center.

The Nursery Level enrolls children aged two and three years and the Pre-Kindergarten children are aged four through six. A maximum of 10 children can be enrolled in each division. This total includes two children with normal hearing, language and speech abilities. These children serve as child language models for the other children and also for the teacher and staff.

The program is staffed by Clinical Supervisor, Bev Dicoskey, who acts also as Head Teacher, and graduate students in hearing impairment, audiology and speech pathology. Students may complete their student teaching requirements in the preschool, and also serve as teacher aides and individual therapists for the children. There are individual therapy sessions twice weekly for all of the children based on their abilities and needs.

The content areas in the Nursery School are related once again to the developmental areas of audition, receptive and expressive language, cognition, motor coordination and self help skills. At the Prekindergarten Level two additional areas are included: pre-reading and math concepts.

Language is developed through a unit approach and applied in a social context.

Selection of units is based on the functional value to the children. Concepts and vocabulary are devised to accommodate individual abilities and levels. In addition language experiences permeate all aspects of the school day from checking attendance to bathroom breaks. There is a continuous input going on.

Cognition is closely related to language indeed often inseparable, and is based on concepts designed in the unit as well as cognitive activities developed with normal children in the daily living situation.

Expressive language is in the form of pre-speech and speech development. The children are expected to function at their best level of verbal interaction. Whether it be merely vocalizing using two word utterances or complete sentences we integrate the Ling approach into the program. Objectives in this area are naturally specific to each child and is part of every activity within the program. (We also used cued speech and total communication).

Audition involves the development of the child's residual hearing through amplification. She/he develops a reliance on his/her aid and early responsibility for assisting in its maintenance. Listening is a continual activity emphasized in all activities. We emphasize awareness of environmental sounds but more important listening to one's own voice and the voices of others for meaning.

Motor Development is a very important component as many of the children have some difficulty in this area (several children have hearing losses due to spinal meningitis.) We have a cooperative program with the Motor Development Clinic at the University of Virginia Memorial Gym which the children attend once a

week, an individualized program geared to their specific motoric needs. In addition daily activities emphasize coordination of large and fine muscles, use of life space and general body control.

The goal in self help skills is to promote independence and responsibility in caring for one's own needs and contributing to the general well being of the nursery school programs. This includes everything from toiletry to cleaning up toys when you are finished playing.

The additional areas of math concepts and pre-reading skills in the prekindergarten help to provide the children with the needed experiences and concepts relating to these important academic areas.

Evaluation in an informal manner is carried out as a continual process. Narrative observations are made of each child on a daily basis to determine progress and/or problems. This information is forwarded to the director, Dr. Hasenstab.

Parental involvement is encouraged and emphasized. Weekly letters from the teacher communicate important school related information, in addition a letter is sent from the director each semester informing parents of changes in staff, the school calendar or items of major interest and importance to parents. Conferences are held as is deemed necessary by parents and/or staff. Scheduled conferences are held twice each semester and during the summer. Home visits are made once each semester and summer term. There are two observation rooms and parents are encouraged to observe as often as possible. Many parents act as volunteers

on field trips and other outings. We continue to work along the same goals for parents as are outlined in the Parent-Infant Program and naturally meet many of the same problems.

Cooperative Services with other Agencies

The fourth educational alternative concerns those children who are serviced by our program in cooperation with other agencies. This area includes multi-handicapped children who we are not equipped to handle. The Piedmont Regional Educational Program (PREP) which is not primarily for children with hearing problems, provides the educational setting and we provide the assessment components and consulting for program development and teacher instruction in working with the hearing impaired child. We send a team of three associate clinicians each semester to assist in this respect. They provide therapy, screening, testing etc.

Many children come to us from outside the Central Virginia area. In this instance we again provide the needed assessment and follow up programming recommendations, consultancies and workshops as are needed in the child's home area.

Evaluation and therapy services are provided to children who are hospitalized in the University of Virginia Medical Center. Parent counseling is also an involved area in this respect.

We also work in conjunction with public health services when they provide services for us as well as vice versa. For example, in child abuse cases, they will carry

out the needed procedures for us. The hospital's proximity is also very convenient. Medical problems, such as a need for stitches can be quickly attended to. Welfare agencies and school clinicians also help in providing transportation of children to and from the Preschool.

The cooperative services component is a very strong and necessary aspect in educational intervention. It allows us (and them) to more fully meet vital needs of hearing impaired and language delayed children and their families. There is a real joy in seeing this cooperation exist.

We have attempted to provide you with an overview of what we feel is a promising program for hearing impaired and language delayed infants and preschoolers at the University of Virginia. We welcome your questions and comments. Thank you for your attention.

BIBLIOGRAPHY

Bangs, T., Vocabulary Comprehension Scale, Learning Concepts
New York: 1975

Bayley, N., The Bayley Scales of Infant Development
Psychological Corporation, New York: 1969

Hannah, E., Applied Linguistic Analyses II, Sin Com Associates
Pacific Palasades: 1977

Ling, D., Speech and the Hearing Impaired Child
A.G. Bell Association for the Deaf, Washington, D.C.: 1976

Northcott, W., Curriculum Guide: Hearing Impaired Children and Their Parents
A.G. Bell Association for the Deaf, Washington, D. C.: 1977